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Environmental Strategy & Engineering

October 22, 2020 GeoInsight Project 5611-001

Melanie Morash
Remedial Project Manager
United States Environmental Protection Agency
Office of Site Remediation and Restoration
One Congress Street, Suite 1100-HBO
Boston, MA 02114-2023

RE: Comments on Proposed Cleanup Plan
Olin Chemical Superfund Site
Wilmington, Massachusetts

Dear Ms. Morash:

GeoInsight, Inc. (GeoInsight) prepared this letter at the request of the Town of Wilmington (the Town) for the Olin Chemical Superfund Site (OCSS). In this letter GeoInsight provides comments on the August 2020 Proposed Cleanup Plan (Plan) prepared by the United States Environmental Protection Agency (USEPA).

INTRODUCTION

The August 2020 Plan identified the USEPA's preferred cleanup actions for the OCSS. Under the July 3, 2007 Administrative Settlement Agreement and Order on Consent, the USEPA divided the OCSS into the following three operable units (OUs):

- OU1 – On-property impacts to vadose-zone soil, surface water, sediment, and potential vapor intrusion, including impacts in the on-property ditch system the calcium sulfate landfill, and the slurry wall containment area. Impacts to soil below the water table are included in OU-3.
- OU2 – Off-property impacts to surface water and sediment, including the off-property east ditch, a small portion of the south ditch, and
- OU3 – On-property and off-property groundwater areas, including the Maple Meadow Brook (MMB) aquifer, groundwater beneath the Olin property, and groundwater located to the south and east of the Olin property. Dense aqueous phase liquid (DAPL) is included in OU3.

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The Plan separated the cleanup alternatives into the following categories:

- Dense aqueous phase liquid (DAPL) and groundwater hot spots (GWHS) (a portion of OU-3);
- Light non-aqueous phase liquid (LNAPL) and surface water (portions of OUs 1 and 2); and
- Soil and sediments (portions of OUs 1 and 2).

The Proposed Plan identifies an interim cleanup action to remediate DAPL and GWHS and final cleanup actions to address LNAPL and contamination in soil, sediments, and surface water. USEPA considers the term "highly contaminated groundwater (HCGW) to be used interchangeably with GWHS and is defined by USEPA as "groundwater containing a large portion of the overall mass of contaminants relative to the overall plume, the removal of which would facilitate remediation of the entire plume by reducing the extent and further migration of the plume."

The interim cleanup action for DAPL and GWHS in groundwater is considered by USEPA to be a short-term cleanup effort until USEPA gathers additional information as part of the ongoing data gaps investigation to inform a final remedial action. The proposed interim action was developed by USEPA to prioritize reduction of exposure risk and reduction of contaminant mass. Final cleanup levels will be selected later, as part of the final remedy determination for groundwater.

COMMENTS

GeoInsight's comments are provided below in no particular order.

CLEANUP ALTERNATIVE FOR DAPL AND GWHS

1. As described in the Plan, the preferred alternative for DAPL and GWHS is an interim cleanup action. The final cleanup action will be selected after the completion of the ongoing data gaps investigation. We believe the plan to begin cleanup activities in areas of known impacts is appropriate, although the Remedial Investigation/Feasibility Study (RI/FS) for OU-3 is currently incomplete We expect that final cleanup plan for OU3 after the data gaps work plan is completed. However, we note that the target concentration that was developed for this interim cleanup plan (i.e., 5,000 nanograms/liter [ng/L] of n-nitrosodimethylamine [NDMA]) is several orders of magnitude above concentrations that are protective of human health and the environment. We note that the Massachusetts Department of Environmental Protection (MADEP) has established a drinking water guideline for NDMA of 10 ng/L (MADEP, 2020, *Standards and Guidelines for Contaminants in Massachusetts Drinking Waters*) and USEPA has identified 0.42 ng/L as a screening level for NDMA in tap water (USEPA, 2014, *Technical Fact Sheet -N-Nitroso-dimethylamine [NDMA]*). The area of NDMA impacts includes the Maple Meadow Brook (MMB) aquifer, which was a drinking water resource for the Town before the impacts forced the closure of the Town's five water supply wells in the MMB aquifer. Our expectation is that the final cleanup plan will include:

- a final cleanup goal for NDMA that will be significantly lower than the target concentration that is the focus of the interim action;
- expanding the groundwater extraction system to remediate areas where NDMA concentrations are less than 5,000 ng/L;
- remediating groundwater to concentrations that do not present a risk to human health or the environment for unrestricted uses, including potable water; and
- restoring the MMB aquifer to meet drinking water standards.

2. The interim groundwater extraction and treatment system must also be designed so that it can be readily expanded to receive additional DAPL and/or contaminated groundwater. The design of the interim groundwater extraction and treatment system should include:

- oversizing the liquid conveyance piping diameter to accommodate potential increases in liquid flow;
- installing spare piping in trenches for potential future uses;
- adding in valves or appurtenances on the liquid conveyance piping so that additional extraction wells can be installed in the future based upon the results of the ongoing data gaps investigation; and
- designing a treatment system with sufficient excess capacity to accommodate an increase in flow rate.

3. Impacted groundwater is located in both the Ipswich River and Aberjona River watersheds, and the interim cleanup plan proposes to recover groundwater present in both watersheds. However, the interim plan proposes that the treated water effluent from the proposed new treatment system will be discharged to surface water. The discharge location is not specified, but the tentative location of the proposed treatment plant is on the eastern side of the OCSS (in the Aberjona River watershed), suggesting that the treated effluent will be discharged to a tributary that ultimately drains to the Aberjona River. This proposed cleanup plan could result in a net loss of water from the Ipswich River watershed, and depletion of groundwater in the MMB aquifer (which is mostly located in the Ipswich River watershed). The treatment system design should therefore include mechanisms to mitigate or minimize potential groundwater depletion in the MMB aquifer.

CLEANUP ALTERNATIVE FOR LNAPL AND SURFACE WATER

The preferred alternative for LNAPL and Surface Water identified in the Plan is alternative LNAPL/SW-3, which consists of the demolition of Plant B, the installation of a multi-phase extraction (MPE) system to recover LNAPL, targeted groundwater extraction to prevent discharge to surface water, and on-site treatment of the extracted groundwater at a new treatment system (i.e., the treatment system that will be constructed to treat recovered DAPL and impacted groundwater). Additional information regarding the remedial alternative selection was presented in an August 5, 2020 USEPA Memorandum titled *Volume III – Comparative Analyses*, and this memorandum identified that the selected alternative was a combination of individual alternatives LNAPL-4 (for LNAPL) and SW-3 (for surface water). As described below, this selected

remedial approach for LNAPL is not expected to be effective in achieving cleanup goals and a different remedial alternative for LNAPL should be considered.

The LNAPL at the OCSS has been described as "#415 Process Oil" and "process oil that contains bis(2-ethylhexyl)phthalate (BEHP), N-nitrosodiphenylamine (NDPA), and trimethylpentenes (TMPs)." Process oils are derived from crude oil after the gasoline and heating oil fractions have been removed by distillation, and therefore this LNAPL is considered to be a highly viscous oil that is relatively immobile. LNAPL mobility tests have not been conducted, but the LNAPL appears to have remained in the same approximate area where it was originally identified and does not appear to be migrating. The process oil was reportedly released during operations of former owners prior to Olin's involvement, and therefore this LNAPL has persisted in the environment for many decades. LNAPL recovery was initiated in 1981, but the rate of LNAPL recovery has been very low (between 1.8 to 3.2 gallons per year) and the LNAPL remains at the OCSS despite nearly 40 years of active remediation.

This information indicates that the LNAPL is effectively immobile in the subsurface and is not sufficiently mobile to be recovered by MPE. A significant mass fraction of the LNAPL is expected to remain in the subsurface after MPE has removed the LNAPL from the extraction wells, particularly in areas away from (or between) the extraction wells. This residual immobile LNAPL will continue to function as an ongoing source of groundwater impacts as soluble constituents present in this LNAPL (e.g., TMPs) will continue to leach into groundwater.

In the evaluation of remedial alternatives described in the August 5, 2020 memorandum, USEPA evaluated an alternative that combined the excavation of LNAPL (LNAPL-6) with the installation of a permeable reactive barrier (PRB) (SW-5) to treat groundwater (combined alternative LNAPL/SW-4), but this alternative was not selected. The August 5, 2020 memorandum indicated that although this alternative scored well for long-term effectiveness ("as nearly all residual LNAPL would be removed by excavation") and would be effective in reducing contaminant toxicity, mobility, or volume through treatment, this alternative did not score as well as the selected alternative (LNAPL/SW-3), partly due to disadvantages associated with the pre-design testing and construction considerations for the installation of the PRB.

We propose that USEPA consider an alternative approach that combines the previously-considered alternatives of LNAPL excavation (LNAPL-6) with groundwater extraction and treatment (SW-3). Under this combined alternative, the LNAPL would be removed via excavation, and groundwater extraction wells would be installed directly in the excavation prior to backfill. This combined alternative has several advantages over the selected LNAPL/SW-3 alternative, including:

- maximizing the benefits associated with the quick removal of the LNAPL;
- reducing excavation/constructing timeframes by eliminating the PRB installation;
- removing LNAPL to eliminate the on-going source of groundwater impacts, reducing the expected time needed for the groundwater extraction and treatment system to achieve remedial goals;
- eliminating PRB pre-design testing;

- reducing the need for engineering controls (e.g., sheet piling) near the Massachusetts Bay Transportation Authority (MBTA) railroad tracks;
- eliminating the need for trenching in sensitive areas to install the PRB;
- eliminating the need to remove and replace the PRB at the end of its useful life; and
- retaining the advantages of groundwater extraction and treatment, which can be adjusted in the future in response to performance monitoring.

We expect that comparative ranking of this alternative would score higher than the selected alternative. We recommend that USEPA revise the selected alternative to combine LNAPL excavation (LNAPL-6) with groundwater extraction and treatment (SW-3).

CLEANUP ALTERNATIVE FOR SOIL AND SEDIMENT

The USEPA's proposed alternative to install a permanent cap over the Containment Area is expected to adequately address residual impacts that are expected to be present in the Containment Area and achieve remedial action objectives. We note that the Olin's investigation activities in the Containment Area were limited and may not have obtained sufficient data to adequately assess the remaining impacts that are expected to be present in the containment area, and therefore the permanent cap is necessary for this area.

We note that there is a significant amount of information to be collected about DAPL and groundwater impacts through the ongoing data gaps investigation. We expect that Olin's work to investigate the data gaps will be comprehensive and will be conducted to the satisfaction of USEPA, the Town, and the public. We expect that USEPA will prepare a final cleanup plan for OU3 after the data gaps work plan is completed and we expect to review and comment on that document on behalf of the Town.

If you have questions regarding these comments, please do not hesitate to contact us.

Sincerely,
GEOINSIGHT, INC.

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Kevin D. Trainer, C.P.G., P.G., L.S.P.
Senior Associate

cc: Jeffrey Hull, Town of Wilmington
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